Jan 22 1322-1-

G. R. S. IX-5]

Previous references.

1921.

(Jan)

File No. 57-21

Serial Nos 1; 1a, 2-8, 8a, 9-11

Later references.

GENERAL AND REVENUE SECRETARIAT.

Serial Nos. 13

Part B for Jan 22

SUBJECT.

Grant of leave to file a Specification of the invention for "Apparatus for effecting Exothermic Chemical Syntheses."

---

47) No 30-32 of 23.11.21 authorising the applicant to file a Specification in respect of the invention referred.

71(9) No 3988 of 24.1.22 notifying the filing of the Specification.

WD 1988—GPB—16,626—23-7-21

(1)

G. R. S. 11] 1921.

GENERAL AND REVENUE SECRETARIAT.

(dte)

NOTES.

File No. 5-7-21

FILE HEADING.

Invention for "Apparatus for effecting exothermic Chemical Syntheses".

From

Mr. W. Grant Rose Solicitor 2 Hastings Street Calcutta

No. Dated 26.7.21 Received 1.8.21

Diary No. 780	Enclos. 1 Appn in duplicate 1 Draft Spare Copies. 1 Specn in duplicate.	Serial No. 1

BRIEF ABSTRACT OF LETTER.

Forwards an application for leave to file a Specification on behalf of his clients L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude in respect of an invention referred to therein.

NOTES AND ORDERS.

No. of Rs 12/- was rec'd in Cash Rec'n of 1.8.21. The appn is based on Indian Patent appn No. 6897 of 1920 which is stated to have been accepted on 9.7.21 but the Indian Patent has not been issued.

NOTES—First Sheet.

31-8-21 13-21 780 (2)

G. R. S. III-2]

General and Revenue Secretariat. | Etc File No. 57 of 1921.

Serial No.	
	Excess amount of Rs 8/- in respect of the assignment deed marked refunded & cld.
	Subd with usual drafts for orders
	13/8
	Mr Bose
1A	To St & Sty Offices No 425 of 15-8-21 Acknowledgs receipt of Rs 10
2	To W. Grant Rose Esq No 1271 of 26-8-21 Acknowledgs receipt of the appl & returns the stamps as stated that the appl is receiving attention
3	To The Supdt of Stamps 1272 of 26-8-21 Forwards the power of attorney & the deed of assignment for being impressed stamps.
4	To The Secy, Bd of Re Advice No 1273 of 26-8-21 Forwards the appl for opinion
5	From the Supdt of Stamps No 86 of 31-8-21 Returns the documents (cl 3) duly stamped

NOTE—Contn. sheet.

Rup

13-21 780 2979 13-21 (3

G. R. S. III-2)

General and Revenue Secretariat. | 9th File No. 57 of 1921.

Serial No.	
6	From Secretary Bd of Ex Advice. No 18 dy 29-10-21. Returns the application & states that leave may be granted to file the specification submitted with a draft. Asst 7-11-21 Jmr Ny 3/11
7	To Govt Rep Legl Calcutta No 3032 dy 23-12-21 Authorises the filing of the specification
8	From Govt Rep Legl Letter dy 12/12-21 Requests that the same may be filed. Submitted with three drafts. The draft & fair copies of the 7 require signature. The R.R. will be duly entered & submitted separately Asst 30-12-21 Jmr A. Asst. 2.1.22
8(a)	T. R. R 478 dy 6.1.22 acknowledging The Sum of Rs 30/- in the Hyderabad
9	No 3988 dy 24.1.22 Notifying The filing of the specification of the invention referred to therein.

NOTE—Contn. sheet.

Rec'd by reg post

1302-21

3571

Dno. 780 (5)
9c
9 2-8-21

From

Mr. W. Grant Rose
Solicitor

2 Hastings Street
Calcutta.

9c 57-21-1

GEN & REV. SECTT.
9 c
1 AUG 1921

To

The Chief Secretary to the Government of
His Highness the Maharaja of Mysore
General and Revenue Secretariat
Bangalore.

Calcutta 26th July 1921.

Sir,

I beg to enclose herewith the necessary papers in respect of an application to the Dewan of Mysore for leave to file a specification on behalf of my clients L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedés Georges Claude in respect of an invention for "apparatus for effecting exothermic chemical synthedes."

The following papers are enclosed herewith namely :-

(1) Application in duplicate

(2) Drawings (one sheet) in duplicate

(3) Power of Attorney

(4) Assignment

(5) Specification in duplicate

I am sending you a money order for Rs.12 of which Rs.1 is for the Mysore Government Stamp on the Power of attorney and Rs.1 for the Mysore Government Stamp on the Assignment and Rs.10 being the prescribed fee for the application.

I may mention that the present application is based on my clients Indian Patent application No.5897 of 1920 which

was

(7

G.R.S. 56.]

GENERAL AND REVENUE SECRETARIAT.

List of "B" Abstracts and Index Slips sent to the Press on the_____190

Branch.	Particulars of the papers despatched.	Remarks

COUPON. The remitter may write here any communication to the payee.

Rs. 12/- As. Amount remitted in respect of Patent application to Bewan of Mysore on behalf of L'Air Liquide etc corresponding to Indian Patent application No 5899 of 1920. per W. Grant Rose, Solicitor.

W Gr & Co 1/8/21

Remitter.

2 Hastings Street

Calcutta

13-21

9 H C 57-21

8

9 H C 57-21-1 A

Duplicate.

(To be returned to the General and Revenue Secretariat for being placed in the file.

1. No. 625
2. Date of Remittance 15/8/21
3. From whom received Mr. N. Gracedeo Solicitor. 2 Hastings Street Calcutta.
4. Date of receipt of amount in the General and Revenue Secretariat 1. 8.21
5. On what account Appn Fee in respect of 13 of 21-22
6. Amount (in figures and words) 10/- Rs ten rupees only
7. The head to which it should be credited:

(To be filled in by the Treasury.)

Secretary to Government,
~~*General Department.*~~

STATE HUZUR TREASURY
AUG 15 1921
BANGALORE.

The above amount has been duly received and credited in the Treasury on this date.

Date

Hd. Acctt. *Treasurer.* *Try. Officer.*

N. B.—Both the counterfoil and the duplicate to be returned to the General and Revenue Secretariat duly signed by the Treasury Department.

13-21 Annual Authority nos 9479(3) 21-6-21 annexed 210/127/Eucl 2 Re 2 dtd 5-7-21

Dy no replied to 780/5/19.

To

The Hon. Grant Rose Esq.,

Solicitor, 2nd Hastings Street,

Calcutta.

Sir,

I am directed to acknowledge the receipt of your letter dated forwarding an application for leave to file a specification on behalf of your clients L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude in respect of an invention for "Apparatus for effecting Exothermic Chemical Syntheses"

based on Indian Patent Appn no 5897/920.

Dy 26/8/21

Subject matter not ascertained

and to state that a sum of annas 8/- is returned herewith since the value of the stamp required for assignment is annas 8/- only. I am to add that the application is receiving the attention of Govt.

I have etc.,

for Secy. to Govt.
Edn. Dept.

13/8

24/8

D-21 Assignment + letter dtd. on 31.8.21 annexed

(K

G. R. S. VI—s-v/14]

DRAFT.

SUBJECT.....

.....

.....

Section. 2te
File No. 57-21
Serial No. 03

Diary No. of letter replied to.....

No 1272/Encls 2 & Rs 1-8-0

GENERAL AND REVENUE SECRETARIAT
( )
, the *191*

To

The Supdt of Stamps
Bangalore

Date of issue.....26/8/21.....

Signed by.....Mr MSR.....

Has the honor to forward herewith a Power of Attorney executed by.....X.....

.....

constituting Mrs W Grant Rose Solicitor 2 Hastings St. Calcutta as Agents in respect of ~~his~~ their invention for "Apparatus for effecting Exothermic Chemical Syntheses"

and to request that the same may be impressed with the Mysore General Stamp of the value of Rupee One, also herewith forwarded, and the Power returned to this office. Also a deed of assignment executed by Georges Claude in favour of the Company rcpd to

By Order,

MSR 1/9/21

For ~~Chief~~ Secretary to Government.

X L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude of 48, Rue St Lazare Paris

as sent with half a rupee & may kindly be impressed with Stamps of that value & returned

MR 1/9/21

List of enclosures.

Copied by.....

Examined by.....

WD 02293—GPB—1,000—2-2-18

G. R. S. VI.—s-v/16]

13-21

DRAFT.

(11)

SUBJECT.....

.....

.....

Section. Ire
File No. 57-21
Serial No. 4

Diary No. of letter replied to.....

No. DC 1273/Encls 3

To

The Secy. Bd of Le. Advice

Bangalore

GENERAL AND REVENUE SECRETARIAT,

( )

the.....*191*

Date of issue.....26/8/21.....

Signed by MV Mys Govt

Has the honor to forward herewith for report under Sec. 6, Cl. (2) of the Mysore Inventions and Designs Regulation, XI of 1894, an application for leave to file a specification of an invention for "Apparatus for effecting Exothermic Chemical Syntheses" received from Messrs. Grant Rose Solicitor. 2 Hastings Street Calcutta on behalf his Clients L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude of 48 Rue St Lazare Paris.

By Order,

MSec 1/9/21

for Secretary to Government.

Edn Dept

1/9/21

Ent

List of enclosures.

Copied by.....

Examined by.....

WD 02295 -GPB—1,000—2-8-18

G.A.C. 57-21-5

Copy of letter No. 86 dated 31st August 1921 from the Superintendent of Stamps in Mysore, Bangalore to the Secretary to Government, General Department.

I have the honour to forward herewith duly stamped eight Powers of Attorney and eight Deeds of Assignment, forwarded with your ~~xxxx~~ numbers noted in the margin and to request the favour of an acknowledgment.

No. 1266,1270,1272,1275,1279,1282,1285,1287. dated the 26th August 1921

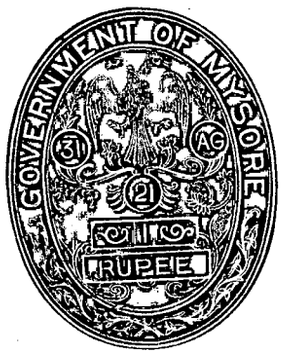
Acknowledged vide no 1553 dt 6-9-21.

.....

5897/25

13

POWER OF ATTORNEY.



IN THE MATTER of the Inventions and Designs Regulation, 1894, of the Government of Mysore and in the matter of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE, of 48, Rue St Lazare, Paris, in the Republic of France.

We, the abovenamed, L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE, do hereby retain, constitute and appoint William Grant Ross of No. 2 Hastings Street in the Town of Calcutta Solicitor and Patent Agent as our Agent and Attorney to apply for and obtain from the Government of Mysore and keep in force an Exclusive Privilege or Letters Patent for "Apparatus for effecting exothermic chemical syntheses" and we authorise to sign our name to such papers and writings and do such acts regarding the same, including the appointment of a substitute or substitutes, as may be necessary or expedient.

Dated this 22nd day of April 1926.

THE COMMON SEAL of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE was hereto affixed in the presence of:-

"L'AIR LIQUIDE"
Ste Anne pr l'Etude et l'Exploitation des Procédés G. Claude
Un Directeur.

13-21 9 & C 57-21-6 (15

Copy of letter no 18 of 29-10-21 from the Secretary, Govt of Sc & Advice to the Registrar of Pats.

I am directed to return herewith the following applications & to state that leave may be granted to file the Specification of inventions contained therein.

1. × × ×
2 × × ×
3. For apparatus for effecting exothermic chemical synthesis.

13-21

5897/20

16

A P P L I C A T I O N.

TO THE DEWAN OF MYSORE.

THE APPLICATION of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE, of 48, Rue St Lazare, Paris, in the Republic of France, for leave to file a Specification under Part 1 of the Mysore Inventions and Designs Regulation, 1894.

1. The Applicants are in possession of an Invention for "Apparatus for effecting exothermic chemical syntheses"

they are the Assignees of the Inventor thereof; and, to the best of their information and belief, the Invention is new within the meaning of Part I of the Inventions and Designs Regulation, 1894, and no circumstance exists which, if the Applicants are authorised to file a specification and file it in accordance with that Part, will disentitle them to an Exclusive Privilege thereunder in respect of the Invention.

The Applicants have applied for a Patent in British India in respect of this Invention No. 5897 dated the 10th day of July 1920.

2. The following is a description of the invention:

In our prior specification, No. 130086 is described a process for the synthetic manufacture of ammonia, which process consists in causing a mixture of nitrogen and hydrogen compressed to a very high pressure, termed a hyper-pressure, the said hyper-pressure being greater than 500 atmospheres and capable of exceeding 2000 atmospheres, to pass over a catalytic material, at a temperature of about from 500 to 700 degrees Centigrade. The ammonia formed is separated by simple liquefaction at ordinary temperatures, and the residual gases are sent into a second catalytic apparatus and afterwards into a third and a fourth if necessary, with liquefaction, at the surrounding temperature, between each passage through the catalytic apparatus, of the ammonia which is formed in each passage.

After the last catalyser, the gaseous residue, if it still contains sufficient hydrogen, may be employed for the production of motive power.

The apparatus which forms the subject matter of the present invention permits of the use of only a single catalytic apparatus, in place of several.

To this end, use is made of a peculiarity due to the employment of hyper-pressures, consisting in the very great difference in density between the gases which have reacted, and consequently containing ammonia, and those, composed of nitrogen and hydrogen, which are to react. At equal temperature, the former have a greater density than the latter, by reason of the contraction undergone by the gaseous mixture $N_2 + 3H_2$, which is transformed into 2 NH_3. The difference in density is rendered very great by the large

atmospheres, and at high temperature, and comprising a tube filled with catalysing material, the reacting gases entering the said tube after circulating around or through it with a view to attaining the temperature of reaction, such temperature being communicated to it by the tube itself during normal working and by a heating coil during the period of starting, successive series of pipes penetrating into the interior of the catalysing tube for the purpose of withdrawing therefrom the ammonia formed, each pipe communicating with the inside of a collector the wall of which is cooled and an outer heat insulated tube concentric with the pipe putting the collector into communication with the interior of the catalysing tube.

The two accompanying drawings represent by way of example, two constructional forms of the apparatus which forms the subject matter of this invention.

In Figure 1, T_1 is the horizontal tube of steel, which supports the hyper-pressures. T_2 is a metal tube which is thin and prevents the injurious action of the temperature and of the gases on the tube T_1, by means of the interposition between T_1 and T_2, of a layer of thermally insulating material, in the manner set forth in our prior specification No. 130087.

A tube T_3 placed inside T_2, and of a length which is limited to a portion only of the length of T_2 by the annular plug M, forms, between those two tubes, an annular chamber traversed by the gases which are to react, which pass into the apparatus at K and are directed in this space towards A.

Thence, they pass through the tube T_3 and that portion of the tube T_2 which prolongs it, both being filled with the catalytic material. In their passage from the pipe K to A, the gases which are to react become heated to the temperature

of reaction, that is to say from 500 to 700 degrees Centigrade either by contact with the tube T_3 due to the heat evolved by the reaction when the apparatus is working normally, or by contact with an electric heating spiral S, when the reaction is started.

The gases then pass over the catalytic material in T_3 and their combination is effected progressively. When they have reached the end of T_3, they should be at a temperature which is sufficient for the synthesis to go on in the part of the tube T_2 beyond M, which does not constitute, like the preceding part, an exchanger of temperatures with the tube T_3.

The proportion of ammonia contained in the gases on their exit from T_3 is already important, and it is of advantage in order to continue the reaction, to eliminate in whole or in part, the ammonia formed. To this end, a vertical tube t communicates, by a lateral plug, K_1, with T_2 and with a collecting receptacle C, the outer wall of which may be cooled by water. Another central tube t', of smaller diameter, dips into the interior of the collector C and puts it into communication with the interior of the catalyser tube T_2. The gases charged with ammonia descend through t' into the collector C. The ammonia they contain condenses and is drawn off by the cock r. They become, in consequence hereof less dense and pass again into the catalyser tube T_2 by the other tube t.

The two tubes t and t' play the part of exchangers of temperatures and the tube t must be insulated, which may be accomplished by surrounding or covering it with any material which is a bad conductor of heat in order that the

gases re-entering by t may be at a temperature very near to that of the gases removed from T_2, so as to avoid any lowering of the temperature below that necessary to the reaction.

A second removal of the gas is effected a little farther on, over the catalyser T_2, by a second arrangement K_2, similar to the preceding one and so on as many times as it is necessary in order that the combination of the gases may be practically complete at the end of the tube T_2. The residual gases, containing the impurities of the initial gases, pass out through a nozzle, not shown situated at the right hand end of the apparatus.

Figure 2 represents another apparatus, in which the gases which are to react are heated by indirect contact with the whole of the catalytic material. It applies to the particular case in which the gases to react pass, not around the catalyser tube, but into the interior thereof by a central tube t'. During their passage through this tube they become heated to the temperature of reaction. Removals of ammonia still take place, by means of arrangements similar to those above described such as K, and the residual gases are evacuated to the exterior, by a nozzle placed at the right hand end of T_1

In both forms of apparatus described, the heat evolved by the reaction, which is more than sufficient to heat the incoming gases to the necessary temperature, is eliminated at the exterior of the tube T_1, by suitable cooling means.

3. The Applicants, therefore, apply for leave to file a Specification of the Invention pursuant to Part I of the Inventions and Designs Regulation, 1894.

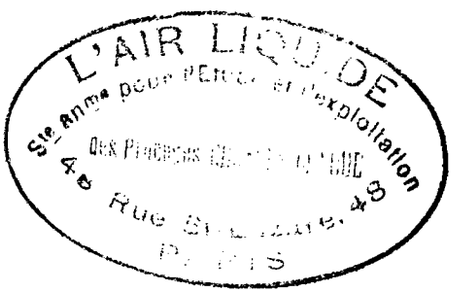
THE COMMON SEAL of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE was hereto affixed in the presence of:-

"L'AIR LIQUIDE"
Soc. Anne p. l'Etude et l'Exploitation des Procédés G. Claude
Un Directeur.

We, the Applicants abovenamed, do declare that the facts stated in this Application are true to our knowledge, except as to matters stated on information and belief and as to those matters we believe them to be true.

Dated this 22nd day of April 1926.

THE COMMON SEAL of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE was hereto affixed in the presence of:-



"L'AIR LIQUIDE"
Soc. Anne p. l'Etude et l'Exploitation des Procédés G. Claude
Un Directeur.

5897/20

No. of Sheets – 1
Sheet No. 1 –

Fig 1.

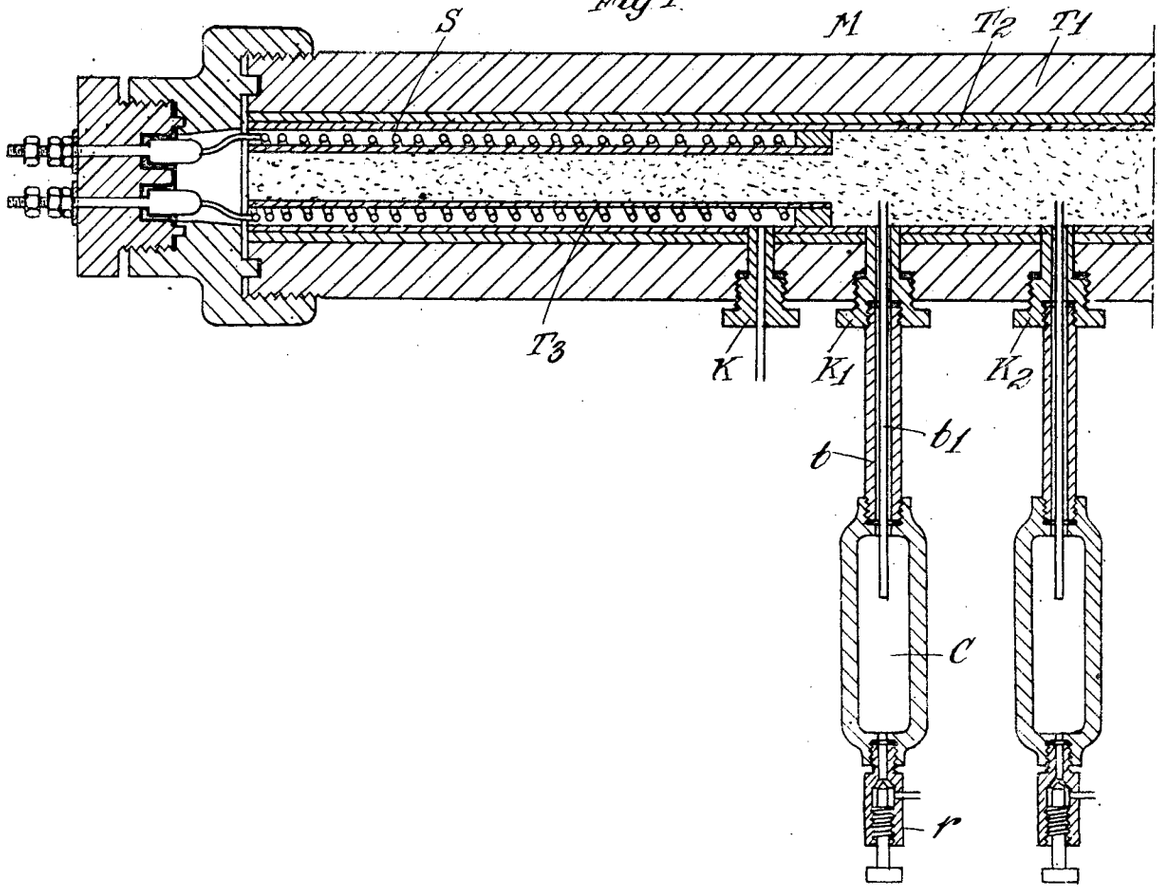
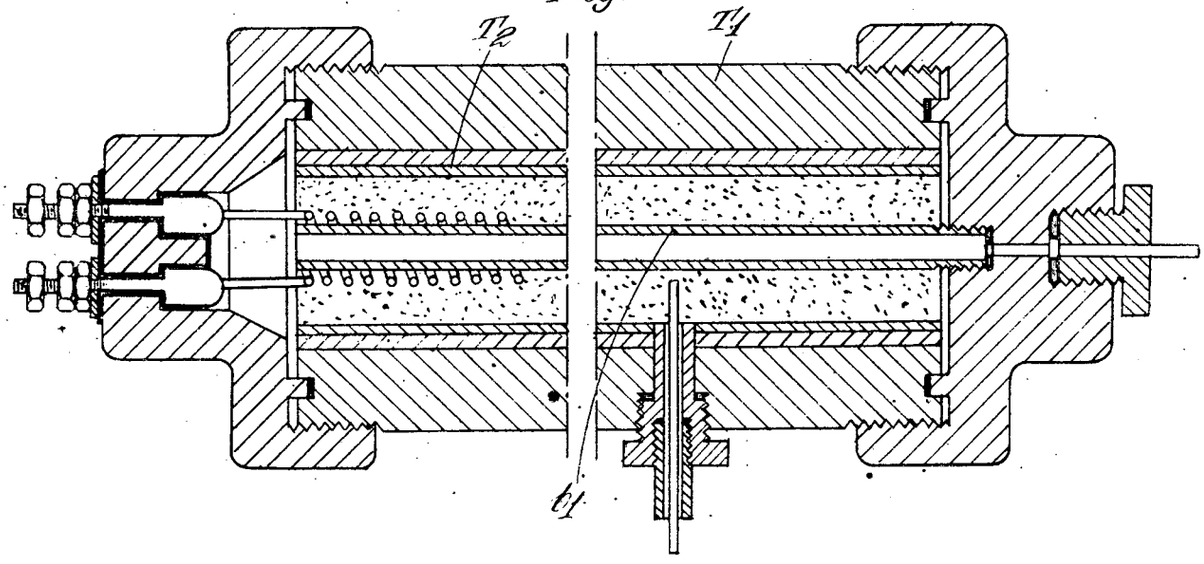


Fig 2.



L'air Liquide Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude

by their attorney
W Grant Rose

ale

(25

No IC 3032 94C57-21-7

G. R. S.VI—s.-v/21]

Government of Mysore.

GENERAL DEPARTMENT.

Register No. 13 of 1921-22

Bangalore, the 23/11/1921.

(based on Indian application No 5897 of 1920

WHEREAS an application, dated the 22nd April 1921 and received on the 1st August 1921, has been submitted under Section 5 of the Mysore Inventions and Designs Regulation, 1894, by L'Air Liquide, Societe Anonyme pour L'etude et L'Exploitation des Procedes Georges Claude, of 48, Rue St Lazare, Paris,

(hereinafter referred to as "the applicant") for leave to file a specification of an invention for 'Apparatus for effecting exothermic chemical syntheses'

And whereas the applicant has duly complied with all the requirements of Section 5 of the said Regulation;

The Government of Mysore are pleased, under Section 6 of the said Regulation, to authorize the applicant to file a specification of the said invention in accordance with the provisions of the said Regulation.

ORDERED, that the applicant be, and he is hereby, informed accordingly.

By Order of the Government of Mysore,

7/11

for Secretary to the Govt. of Mysore,
General Department.

Certified that the fees prescribed in the fourth schedule to the Mysore Inventions and Designs Regulation, 1894, in respect of the application for leave to file the said specification and of the filing thereof have been paid by the applicant, and that the specification hereinbefore described has been duly filed in accordance with the provisions of Section 8 of the said Regulation on this the 17th day of December 1921.

21.12

for Secretary to the Govt. of Mysore,
General Department.

26

(Section 8 of the Inventions and Designs Regulation, 1894.)

8. (1) If within six months from the date of an order under Section 6, Sub-Section (1), or within such further time, not exceeding three months, as the Government of Mysore, in its discretion, may, on cause shown to its satisfaction and on payment of the fee prescribed in that behalf in the fourth schedule, see fit to allow, the applicant causes a specification of his invention to be filed in manner by this Part required, and the fee prescribed in the fourth schedule in respect of the filing of the specification to be paid, the applicant shall, subject to the other provisions of this Part, be entitled to the exclusive privilege of making, selling and using the invention in the Territories of Mysore, and of authorizing others so to do, for a term of fourteen years from the date of the filing of the specification.

(2) But an exclusive privilege in respect of an invention of a new manufacture shall, notwithstanding anything in Sub-Section (1), cease, if the inventor fails to pay, within the time limited in that behalf by the fourth schedule, any fee prescribed in that schedule in respect of the continuance of the privilege.

(3) If, nevertheless, in any case, by accident, mistake, or inadvertence, an inventor fails to pay any such fee within the time so limited, he may apply to the Government of Mysore for an enlargement of the time for making the payment.

(4) Thereupon the Government of Mysore may enlarge the time accordingly, on payment of the fee prescribed in that behalf in the fourth schedule, and subject to the following conditions, namely :—

(*a*) the time for making a payment shall not in any case be enlarged for more than three months ; and

(*b*) if any suit is instituted in respect of an infringement of the exclusive privilege committed after a failure to make a payment within the time limited for the making thereof and before the enlargement of that time, the Court disposing of the suit may, if it thinks fit, refuse to award or give any damages in respect of the infringement.

W D 02300—GPB—500—24-11-16

28211

(27)

2979

17-12-21.

9 re 57-21-9

5 DEC 1921

From

Mr. W.Grant Rose,

Solicitor,

2, Hastings Street, Calcutta.

To

The Chief Secretary to the Government of

His Highness The Maharajah of Mysore

General Department

Bangalore, Mysore.

7/12

Calcutta 12th December 1921.

Sir

Patent Register No. 13 of 1921/22

With reference to your letter No. I C 3036/I & C 60-21-9 dated the 23rd ultimo forwarding the Government order granting leave to file specification in respect of the application Of L'Air Liquide &c being Register No 13 of 1921/22 I beg to enclose herewith under registered Cover two copies of the specification in respect of such application which together with the two copies of specification already submitted with the application will make four copies thereof. I also enclose one copy of the drawings which together with the two copies already sent with the application will make three copies thereof and I beg that the same may be filed in terms of the order granting leave.

I also beg to enclose herewith the Government order No I C 3032/I & C 57-21-7 Register No 13 of 1921/22 dated the 23rd November 1921 so that the certificate at foot thereof certifying that the specification has been filed and the fees paid may be duly signed and the order thus completed returned to me.

I

13-2-1

(29

9+c 57-21-8(a) D 2979.

Duplicate.

(To be returned to the General and Revenue Secretariat for being placed in the file.

1. No. 478.
2. Date of Remittance 6-1-22
3. From whom received Mr Grant, Rob, Calcutta
4. Date of receipt of amount in the General and Revenue Secretariat 17-12-21
5. On what account Subsig fee in reffrl of Govt no 13 of 1921
6. Amount (in figures and words) Rs 30/- rupees thirty only
7. The head to which it should be credited.

(To be filled in by the Treasury.)

for Secretary to Government,
Revenue and General Department.

The above amount has been duly received and credited in the Treasury on this date.

Date 6/1/22

Hd. Acctt. *Treasurer.* *Try. Officer.*

N. B.—Both the counterfoil and the duplicate to be returned to the General and Revenue Secretariat duly signed by the Treasury Department.

ols 13-21 ✓ 3&4/5 (30

2 copies

Htc 57-21-9

GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE.

GENERAL AND REVENUE SECRETARIAT

Bangalore, Dated 24/1/ **1922**

No. IC3988

NOTIFICATION.

(PATENT)

The following specification of an invention has been filed in accordance with Sections 8, 9, 10 and 11 of Regulation XI of 1894 (The inventions and Designs Regulations) and is open to inspection at the Mysore Government Secretariat on application to the ~~Chief~~ Secretary to the Government of His Highness the Maharaja of Mysore and on payment of a fee of one Rupee.

general opt

By Liti Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation des Procedes Georges claude, of 48, Rue St Lazare, Paris.

"Apparatus for effecting exothermic chemical syntheses"

By Order,

2.1.22

for ~~Chief~~ Secretary to Government.

To

The Compiler, Mysore Gazette, for publication.

735

20-1-22

G. R. S. VI—s-v/18

Drafts (31

DRAFT.

SUBJECT.....

.....

.....

No.

Section. Ite
File No. 57-21
Serial No. 10

Diary No. of letter replied to.....

No IC 3989(2)

GENERAL AND REVENUE SECRETARIAT
( )
the.....*191*

To

W. Grant Rose Esq.
Solicitor
2 Hastings Street
Calcutta

Date of issue 24/1/22

Signed by Mr J.A.G

Sir,

With reference to your letter dated 12-12-21, I am directed to forward copy of a Notification No. IC 3988/Ite dated 5-7-21-9 Oy. 24-1-22 issued by this Government in regard to the invention filed by you under Regulation XI of 1894 (The Inventions and Designs Regulations.)

The order granting permission to file specification is herewith returned, with the certificate at foot, duly filled in and signed.

I have, etc.,

For *Secretary to Government.*
Gloph
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10-1-22

G. R. S. VI—G/32]

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SUBJECT.....

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Diary No. of letter replied to.....

General and Revenue Secretariat

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Date of issue 24/1/22

Signed by J.M.J. A.G

Section 9 re

File No. 57-21

Serial No. 11

No. 3990-2/Rec'd to each

To 1) The Supdt, Govt Museum
2) The Chief Inquiries & Illpose
3) The Secy Bd of Re Advice

Hon'ble Minister to forward Reports or records in his office copy of a Specification for ~~of an~~ invention for 'Apparatus for effecting exothermic chemical syntheses' by Litii Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude 75 & 8, Rue St Lazare, Paris.

B. O.

2-1-22

Secy to Govt

over.

20-1-22

List of enclosures.

Copied by

Examined by

A P P L I C A T I O N.

TO THE DEWAN OF MYSORE.

THE APPLICATION of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE, of 48, Rue St Lazare, Paris, in the Republic of France, for leave to file a Specification under Part 1 of the Mysore Inventions and Designs Regulation, 1894.

1. The Applicants are in possession of an Invention for "Apparatus for effecting exothermic chemical syntheses"

they are the Assignees of the Inventor thereof; and, to the best of their information and belief, the Invention is new within the meaning of Part I of the Inventions and Designs Regulation, 1894, and no circumstance exists which, if the Applicants are authorised to file a specification and file it in accordance with that Part, will disentitle them to an Exclusive Privilege thereunder in respect of the Invention.

The Applicants have applied for a Patent in British India in respect of this Invention No. 5897 dated the 10th day of July 1920.

2. The following is a description of the invention:

In our prior specification, No. 130086 is described a process for the synthetic manufacture of ammonia, which process consists in causing a mixture of nitrogen and hydrogen compressed to a very high pressure, termed a hyper-pressure, the said hyper-pressure being greater than 500 atmospheres and capable of exceeding 2000 atmospheres, to pass over a catalytic material, at a temperature of about from 500 to 700 degrees Centigrade. The ammonia formed is separated by simple liquefaction at ordinary temperatures, and the residual gases are sent into a second catalytic apparatus and afterwards into a third and a fourth if necessary, with liquefaction, at the surrounding temperature, between each passage through the catalytic apparatus, of the ammonia which is formed in each passage.

After the last catalyser, the gaseous residue, if it still contains sufficient hydrogen, may be employed for the production of motive power.

The apparatus which forms the subject matter of the present invention permits of the use of only a single catalytic apparatus, in place of several.

To this end, use is made of a peculiarity due to the employment of hyper-pressures, consisting in the very great difference in density between the gases which have reacted, and consequently containing ammonia, and those, composed of nitrogen and hydrogen, which are to react. At equal temperature, the former have a greater density than the latter, by reason of the contraction undergone by the gaseous mixture $N_2 + 3H_2$, which is transformed into 2 NH_3. The difference in density is rendered very great by the large

atmospheres, and at high temperature, and comprising a tube filled with catalysing material, the reacting gases entering the said tube after circulating around or through it with a view to attaining the temperature of reaction, such temperature being communicated to it by the tube itself during normal working and by a heating coil during the period of starting, successive series of pipes penetrating into the interior of the catalysing tube for the purpose of withdrawing therefrom the ammonia formed, each pipe communicating with the inside of a collector the wall of which is cooled and an outer heat insulated tube concentric with the pipe putting the collector into communication with the interior of the catalysing tube.

The two accompanying drawings represent by way of example, two constructional forms of the apparatus which forms the subject matter of this invention.

In Figure 1, T_1 is the horizontal tube of steel, which supports the hyper-pressures. T_2 is a metal tube which is thin and prevents the injurious action of the temperature and of the gases on the tube T_1, by means of the interposition between T_1 and T_2, of a layer of thermally insulating material, in the manner set forth in our prior specification No. 130087.

A tube T_3 placed inside T_2, and of a length which is limited to a portion only of the length of T_2 by the annular plug M, forms, between those two tubes, an annular chamber traversed by the gases which are to react, which pass into the apparatus at K and are directed in this space towards A.

Thence, they pass through the tube T_3 and that portion of the tube T_2 which prolongs it, both being filled with the catalytic material. In their passage from the pipe K to A, the gases which are to react become heated to the temperature

of reaction, that is to say from 500 to 700 degrees Centigrade either by contact with the tube T_3 due to the heat evolved by the reaction when the apparatus is working normally, or by contact with an electric heating spiral S, when the reaction is started.

The gases then pass over the catalytic material in T_3 and their combination is effected progressively. When they have reached the end of T_3, they should be at a temperature which is sufficient for the synthesis to go on in the part of the tube T_2 beyond M, which does not constitute, like the preceding part, an exchanger of temperatures with the tube T_3.

The proportion of ammonia contained in the gases on their exit from T_3 is already important, and it is of advantage in order to continue the reaction, to eliminate in whole or in part, the ammonia formed. To this end, a vertical tube t communicates, by a lateral plug, K_1, with T_2 and with a collecting receptacle C, the outer wall of which may be cooled by water. Another central tube t', of smaller diameter, dips into the interior of the collector C and puts it into communication with the interior of the catalyser tube T_2. The gases charged with ammonia descend through t' into the collector C. The ammonia they contain condenses and is drawn off by the cock r. They become, in consequence hereof less dense and pass again into the catalyser tube T_2 by the other tube t.

The two tubes t and t' play the part of exchangers of temperatures and the tube t must be insulated, which may be accomplished by surrounding or covering it with any material which is a bad conductor of heat in order that the

gases re-entering by t may be at a temperature very near to that of the gases removed from T_2, so as to avoid any lowering of the temperature below that necessary to the reaction.

A second removal of the gas is effected a little farther on, over the catalyser T_2, by a second arrangement K_2, similar to the preceding one and so on as many times as it is necessary in order that the combination of the gases may be practically complete at the end of the tube T_2. The residual gases, containing the impurities of the initial gases, pass out through a nozzle, not shown situated at the right hand end of the apparatus.

Figure 2 represents another apparatus, in which the gases which are to react are heated by indirect contact with the whole of the catalytic material. It applies to the particular case in which the gases to react pass, not around the catalyser tube, but into the interior thereof by a central tube t'. During their passage through this tube they become heated to the temperature of reaction. Removals of ammonia still take place, by means of arrangements similar to those above described such as K, and the residual gases are evacuated to the exterior, by a nozzle placed at the right hand end of T_1.

In both forms of apparatus described, the heat evolved by the reaction, which is more than sufficient to heat the incoming gases to the necessary temperature, is eliminated at the exterior of the tube T_1, by suitable cooling means.

HAVING NOW particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:-

1. Apparatus for effecting the synthesis of ammonia under very high pressures, greater than 500 atmospheres and capable of exceeding 2000 atmospheres and at high temperature consisting of a tube filled with catalysing material, the reacting gases entering the said tube after circulating around it with a view to attaining the temperature of reaction, such temperature being communicated to it by the tube itself during normal working and by a heating coil during the period of starting successive series of pipes penetrating into the interior of the catalysing tube for the purpose of withdrawing therefrom the ammonia formed, each pipe communicating with the inside of a collector the wall of which is cooled and an outer heat insulated tube concentric with the pipe putting the collector into communication with the interior of the catalysing tube.

2. A modification of the device according to claim 1, in which the reacting gases are admitted to the interior of a central tube of small diameter traversing the catalysing mass so as to reach the head of the catalysing tube, into which the reacting gases then enter, the withdrawal of the synthetic products being effected as before by means of pipe connections opening into the catalysing mass, with an external tube for the return of the lighter gases into the cycle of reaction.

3. Apparatus for effecting the synthesis of ammonia under very high pressure and at a high temperature substantially as herein described with reference to the accompanying drawing.

3. The Applicants, therefore, apply for leave to file a Specification of the Invention pursuant to Part I of the Inventions and Designs Regulation, 1894.

THE COMMON SEAL of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE was hereto affixed in the presence of:-

L'AIR LIQUIDE Ste Anme pour l'Etude et l'exploitation des Procédés Georges Claude 48 Rue St-Lazare. PARIS

"L'AIR LIQUIDE" Ste Anme p' l'Étude et l'Exploitn des Procédés G. Claude Un Directeur.

We, the Applicants abovenamed, do declare that the facts stated in this Application are true to our knowledge, except as to matters stated on information and belief and as to those matters we believe them to be true.

Dated this 22nd day of April 1926.

THE COMMON SEAL of L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE was hereto affixed in the presence of:-

L'AIR LIQUIDE Ste Anme pour l'Etude et l'exploitation des Procédés Georges Claude 48 Rue St-Lazare. PARIS

"L'AIR LIQUIDE" Ste Anme p' l'Étude et l'Exploitn des Procedés G. Claude Un Directeur.